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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/425,234	10/25/1999	HAMID RABIE	4320-91	9266

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EXAMINER	
MENON, KRISHNAN S	
ART UNIT	PAPER NUMBER
1723	

DATE MAILED: 06/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/425,234	RABIE ET AL.	
	Examiner	Art Unit	
	Krishnan S Menon	1723	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 June 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-17 and 27-38* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-17 and 27-38* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claims 1-17 and 27-38 are pending.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington,* 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-17 and 27-38 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-25 of copending Application No. 10/377,647 and claims 1,3, and 6-61 of copending application 10/461,687. Although the conflicting claims are not identical, they are not patentably distinct from each other because all the claims recite methods of cleaning a membrane using cleaning chemicals with obvious variations in cleaning agent concentrations and/or the number of cleaning cycles.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. Claims 1-15 and 27-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith et al (US 5,403,479) in view of applicant's admission of known prior art.

Claim 1: Smith teaches a method of cleaning membranes immersed in water (abstract, figures) comprising performing one or more cleaning events per week (Fig 4,6) having steps of stopping permeation, flowing a chemical cleaner through the membrane in the reverse direction of permeate flow, resuming permeation, with the weekly CT being between 2000 and 30,000 min.mg/L (table line 9: 100 ppm (NaOCl) * 60 min = 6000 min.mg/L; col 11 line 30-35: duration about 1 Hr; col 15 lines 34-36: concn. At 10 ppm), wherein the cleaning events reduce the rate of decline of the membrane permeability (col 11 line 20 – col 13 line 5). The CT values also are only result effective variables optimizable depending on the degree of fouling of the membranes due to feed water quality, quantity, and the process flow rate. Discovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art. In re Boesch and Slaney, 205 USPQ 215 (CCPA 1980); In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977); In re Aller, 42 CCPA 824, 220 F.2d 454, 105 USPQ 233 (1955). (See also Smith col 19 lines 5-13)

Smith does not teach the definition of CT as in claim 1(c)(i). However, this is only a mathematical expression of the measure of concentration of the cleaning solution, times the duration of cleaning cycle, for the convenience of the inventors, and is not a patentable limitation.

Smith teaches about performing recovery cleaning by the prior art methods in "Background of the Invention". More importantly, Smith teaches the first cleaning (or, the intensive recovery cleaning) as defined by the applicant in the specification (page 3 second para, referencing US 5,403,479, in col 19 lines 27-30). Smith also teaches the method of back-flushing with a cleaning solution, or the "in-situ cleaning", which is like the "cleaning events". In addition, Smith teaches "cleaning events" having varying degrees of intensity as best exemplified in fig 4. (see smith figures, abstract, col 11 line 22 – col 12 line 25, col 19 lines 5-47). Smith also teaches a method of infrequent harsh cleaning with more frequent back-flushing in lines 18-30, col 9.

What Smith does not expressly teach is performing the "first cleaning" from time to time, with more frequent "event cleaning" in between, as in claim 1, in that particular format. Applicants' own admission of 'known process for cleaning membranes' teaches these steps in the specification pages 1-3 (Background of the Invention), especially page 2 lines 6-7. It would be obvious to one of ordinary skill in the art at the time of invention to modify the methods taught by Smith with the 'known process' of cleaning the membrane as taught by the admission of prior art by the applicant for more effective cleaning. Smith provides sufficient disclosure for the first cleaning in the form of methods taught by prior arts and his own inventions. One skilled in the art could pick

cleaning methods of varying intensity just from Smith's own inventions, because the disclosure of the first cleaning, or the "intensive/recovery cleaning, provided by the applicant is from Smith's invention (see specification page 3 lines 7-14).

With regard to the periodicity of cleaning events (newly added in the amendment of 6/4/04), Smith teaches periodic cleaning in col 1 lines 6-31, and Smith's development of the cleaning method is for periodic cleaning of the membrane.

Claims 2-4: Smith teaches processing waste water (abstract), and ground water (col 20 lines 35-40) which is well known for drinking. Re the CT values, in these claims, it is only a result effective variable optimizable depending on the feed water quality, quantity, and the process flow rate. Discovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art. In re Boesch and Slaney, 205 USPQ 215 (CCPA 1980); In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977); In re Aller, 42 CCPA 824, 220 F.2d 454, 105 USPQ 233 (1955). (See also Smith col 19 lines 5-13)

Claim 5 adds additional limitations of pulsed flow for the chemical cleaner and a wait period with the pump off for the chemical cleaner to 'clean'. Smith teaches pulsed flow (col 11 lines 35-50), and the need for soak periods (col 14 lines 55-68), or blocking the flow of solution in col 12 line 68 – col 13 line 5, and the details and the need for of pulsing in col 16 line 60 – col 17 line 6. One of skill in the art could optimize the length of pulse and wait periods depending on the nature of water treated (In re Boesch).

Re the newly added limitation (amendment of 6/4/04), Smith teaches one or more membranes arranged into one or more modules with permeate side of the

membranes a space in communication with headers – see figures, especially, Fig 2. In step (b), chemical cleaner reaching the header would remain in the header or flow in a direction opposite to the normal permeate flow direction – which is the back-flush mode, and Smith teaches this in col 11 lines 22-60.

Claim 6 adds the more intensive cleaning as being 15 days apart, which is a result effective variable (In re Boesch...)

Claims 7-10: the weekly CT values are result effective variables as discussed in claims 2-4 above.

Claims 11-12: the time duration of the pulse and wait are, again, result effective variable (In re Boesch..)

Claim 13: pulses selected to provide chemical cleaner in an area in the membranes and in an area in tank water adjacent the outside of the membrane: see Smith abstract re the fouling film formed on the outside surface of the membrane, and col 14 lines 33-68 re effect of the cleaning solution on the fouling biofilm.

Claim 14: the pulsing pressure is in the range as in claim 14, since Smith uses min 100 kPa *absolute* pressure (Smith says this as 1 bar or at least 0.1psig, which means the 100kPa is absolute pressure). Since 5 – 55 kPa is above the pressure on the outside of the membrane (which at least would be one atm, or about 1 bar), the pressures are within the same range.

Claim 15: the flow rate of the membrane should be inherently the same in Smith, since Smith uses similar membranes (UF or microfiltration – see abstract). Under the principles of inherency, if a prior art device, in its normal and usual operation, would

necessarily perform the method claimed, then the method claimed will be considered to be anticipated by the prior art device. When the prior art device is the same as a device described in the specification for carrying out the claimed method, it can be assumed the device will inherently perform the claimed process. In re King, 801 F.2d 1324, 231 USPQ 136 (Fed. Cir. 1986)

Claim 27: all the limitations of claim 27 are already discussed in claims 5-7, except the chemical cleaner concentration between 20 and 200 mg/L and the time period of 10-100 min. Smith teaches these in col 11 lines 32-35 and the table in col 15 at line 9.

Claims 28-30: CT values – result effective variable (In re Boesch)

Claim 31: Smith teaches the membrane as immersed in water, outside of the membrane is in contact with water containing solids and there is no agitation (see abstract; col 1 lines 33-66 and col 2 lines 62-65).

Claim 32: see rejection of claim 6

Claim 33: the performance recovery in the membrane by the cleaning is at least to 70% of the initial flux in Smith (see abstract).

Claim 34: the membrane is hollow fiber (col 15 lines 48-62).

Claim 35: Smith does not teach any agitation.

Claim 36: Flowing chemical cleaner by introducing chemical cleaner to the flowing water – see figures. Smith provides cleaning chemical in a tank which is flowed through the system, in water, which is equivalent to what is claimed.

Claim 37: cleaning at regular intervals and each having the same CT: optimizing a result effective variable, In re Boesch...

2. Claims 16, 17 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith et al (US 5,403,479) in view of applicant's admission of known prior art, and further in view of Kawanishi et al (US 5,647,988).

Smith in view of applicants' admission of known prior art teaches all the elements of claim 5. Claims 16 and 17 add the further limitation of removing the chemical cleaner through a drain in the tank. Smith teaches that draining the tank would be unnecessary because the amount of cleaning agent discharged would be insignificant to the volume of water treated (col 11 lines 50-60). However, Kawanishi teaches draining after cleaning (col 1 lines 48-63). It would be obvious to one of ordinary skill in the art at the time of invention that when excessive amounts of cleaning agents are used, it would be better to drain the tank in the Smith's teaching to eliminate any possible adverse effects of the cleaning chemical in the filtrate, as taught by Kawanishi.

Claim 38: replacing some or all of the water in the tank with feed water between step (B)(b) and (B)(c): since the step (B)(c) after step (B)(b) of claim 1 is resuming permeation, one would be constantly replacing the water in the tank to replace the water taken out in the permeate. Smith teaches that by his method, draining the tank becomes unnecessary (col 11 lines 50-60) because the amount of cleaning chemical discharged in to the tank is insignificant compared to the volume of the tank. However, if reducing the level of cleaning chemicals introduced into the water becomes necessary

because of any reason, one of ordinary skill in the art would obviously drain the tank, as taught by Kawanishi (col 1 lines 48-63).

Response to Arguments

Applicant's arguments filed 6/4/04 have been fully considered but they are not persuasive.

In response to applicants' argument that the Figures 4 and 6 of Smith reference do not teach periodic cleaning events, it may be noted that Smith developed the method for periodic cleaning of the membranes as taught in the first para of col 1. Also, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

Re arguments about the CT values, they are addressed in the rejection.

In response to applicants' arguments about the combination of first cleaning and cleaning events in page 10 bottom paragraph: applicants seemed to have conveniently omitted the reference to figure 4 in the rejection about the event cleaning. In any case, the test for obviousness is not bodily incorporation, but what the teachings of the reference would have suggested to one of ordinary skill in the art. *In re Keller*.

In response to the applicants' argument that the response to arguments section of the advisory action do not provide any prima facie evidence of obviousness: Please see MPEP 714.13 re the scope of an advisory action.

Rest of the arguments have already been addressed in the rejection and/or prior office actions.

Conclusion

This is a first action after the third RCE, and is made non-final.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Krishnan S Menon whose telephone number is 571-272-1143. The examiner can normally be reached on 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wanda L Walker can be reached on 571-272-1151. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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